Information Sheet: Handling Chemicals Period_____ Date_____

(Frameworks Code)

Part A: Solid Chemicals

1. Handling Solids:

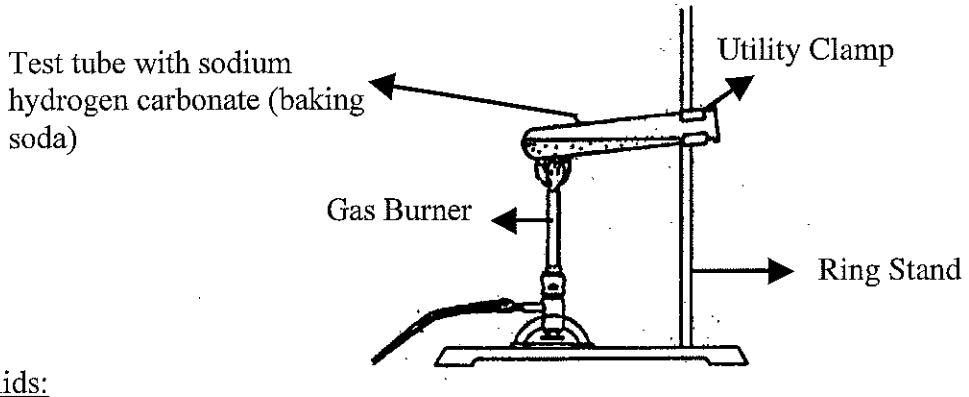
Never remove a reagent bottle from the supply desk. Transfer solid chemical to the student laboratory desk on a piece of folded (creased) paper.

A. Transfer by scoop directly to the container if the mouth of the container to be used is larger than the scoop.

B. Transfer by the scoop to a folded (creased) paper and carefully slide the solid chemical down the crease into the container.

C. Granular solids may be poured directly to the creased paper by slowly and carefully rotating the reagent jar until the desired amount of chemical is obtained.

To obtain a definite mass of solid chemical, place a creased paper on the pan of a balance. Record the mass of the paper. Measure the amount of solid chemical needed by placing the chemical onto the paper. (Remember that the mass of the paper must be subtracted from the total mass measured.)



2. Heating Solids:

Some solids contain water in their crystals; others do not. Some solids release a gas when heated. Other solids react with each other during heating and a gas is released.

A test tube is usually used as a container for solids that will be heated. The size of the test tube depends on the activity that you are carrying out. A test tube **should not** be more than one-third full. It may be supported in a utility clamp on a ring stand. In this case, the flame is **continually** waved under the solid from the upper portion to the lower part. A test tube may also be held with a test tube clamp, and passed through the flame. **Note:** The clamp should be placed near the mouth of the test tube before heating.

The test tube is held almost horizontally when solids give off a gas that is being delivered to another container. If water is released from a solid, you would slant the test tube with the mouth pointed slightly downward. The solid is **always** spread out along the test tube to allow room for the escaping gas. If this is not done, and heat is applied to the lower portion of the solid, the solid would be pushed up the test tube and would clog the delivery tube. **Note:** A clogged delivery tube causes accidents.

Wearing protective goggles are required when using chemicals.

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Part B: Liquid Chemicals

1. Heating Liquids:

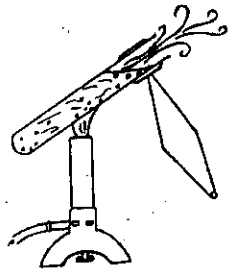


Fig. 1

Glass and porcelain are poor conductors of heat. They may crack if heated only in one spot. The flame is therefore moved back and forth to assure uniform heating of the glass. This procedure must be followed when heating liquids in test tubes. See Fig. 1.

Keep the heat below the surface of the liquid. Slant the test tube to allow the escape of the gas. **Never heat a test tube containing any substance (including water) while it is pointed toward you or anyone else.** Use a test tube clamp when heating a substance in a test tube. **Wearing protective goggles is required when heating liquids.**

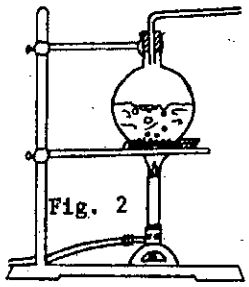


Fig. 2

The formation of large bubbles in boiling liquids, due to local superheating and referred to as "bumping", can sometimes be prevented by the addition of a few glass beads or small pieces of capillary tubing to the liquid.
See Fig. 2.

2. Pouring Liquids:

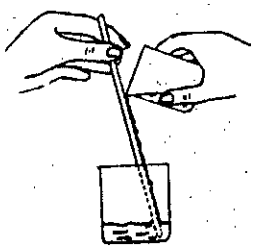


Fig. 3

When pouring liquids from a beaker, hold a stirring rod against the pouring edge. To avoid splashing, hold the lower end of the rod against the side of the container into which you are pouring.
See Fig. 3.

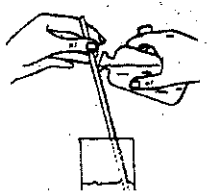


Fig. 4

When pouring from a bottle, keep the stirring rod against the mouth of the bottle. See Fig. 4. If too much liquid is poured out, do not return some of the liquid to the reagent bottle.

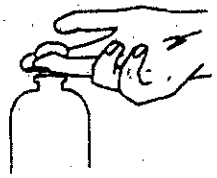
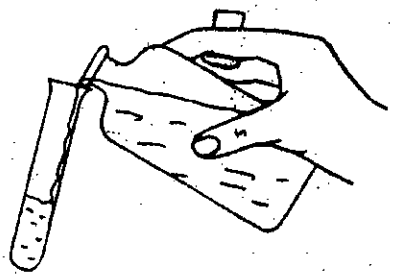


Fig. 5

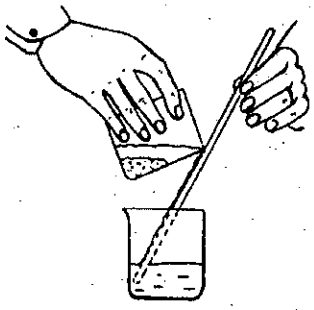
To properly remove a liquid from a stoppered bottle: Grasp the stopper between the forefinger and middle finger. (This may be altered for some acids.) Pick up the bottle with the same hand grasping the stopper, and carefully pour into the container. See Fig. 5.



The stopper should **never** be placed on the tabletop or shelves. It may contaminate the table or shelf. The stopper may also pick up impurities that are transferred to the reagent bottle.

If the top or sides of a reagent bottle need cleaning, stopper tightly, and wash under running water.

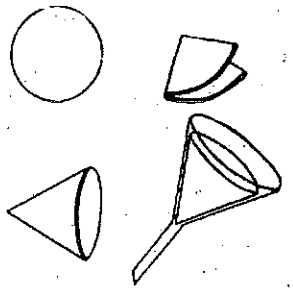
3. Decanting:



This is a process of pouring off the clear liquid (supernatant) that is above a settled precipitate.

This is one process of separation of liquids and solids. If the solid is scattered throughout the liquid, it is best to use the filtration method.

4. Filter Paper:



Filter paper comes in many textures and sizes. Each has its use in the lab. Its chief job is to hold back the solids that you wish to separate from a liquid.

Practice folding filter paper. Fold in half, then fold again so that you have a fourth of a circle. Separate the folds of the filter, with three layers on one side and one on the other (forming a cone-shape), then place in the funnel.

The funnel should be wet before the material is added. Use the wash bottle to wet down the filter and press the edges firmly against the sides of the funnel. Do not wet the funnel or filter with water when you are filtering something that is not miscible with water.

5. Filtering:

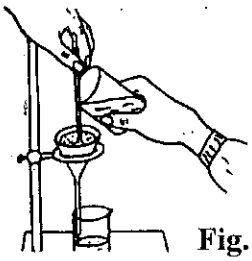


Fig. 6

When filtering, pour the mixture from your container down a stirring rod held near the filter paper in the funnel. To prevent splashing, the bottom of the funnel should rest against the side of the container that will catch the filtered liquid. See Fig. 6.

Residue – material caught in the filter paper after filtering

Filtrate – clear liquid that has passed through the filter paper to the beaker below

Part C: Odors and Inflammable Substances

1. Odors:

All lab rooms should be well ventilated. If you are working with a liquid whose odor you wish to detect, **never** bring the container up to the nostril and inhale. Wave the fumes toward you and "sniff" cautiously for their odor. Hydrochloric acid fumes and the fumes from strong ammonia water are especially irritating to the nostril membranes. Other fumes that should not be inhaled are those from chlorine, bromine, iodine, sulfur dioxide, carbon tetrachloride, benzene, carbon disulfide, ether, chloroform, and many others.

2. Inflammable Substances

- If necessary to heat a solution containing alcohol, a water bath should be used.
- Inflammable liquid wastes or materials soaked in such substances should be carefully disposed or in fireproof receptacles.
- Benzene is both flammable and highly toxic, and it should never be used where another solvent can be substituted.
- Ether is very flammable and extreme care should be used.
- Carbon disulfide is sometimes used as a solvent of sulfur and other sulfur containing compounds. However, **never** use this liquid near a heated surface or an open flame. It is poisonous. Good ventilation is needed.